INPLASY PROTOCOL

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Support: Not applicable

Review Stage at time of this submission: Formal screening of search results against eligibility criteria.

Conflicts of interest:
None declared.

Global epidemiology and related prognosis of traumatic arterial injuries associated with fractures of the lower limb: protocol for a systematic review and meta-analysis

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Review question / Objective: 1. What is the prevalence of TAI associated with FF and / or TF in trauma to the lower limb? 2. What is the most common pathological form of AI associated with FF and / or TF? 3. What is the amputation rate and mortality after revascularization of an AI to FF and / or TF?

Condition being studied: Arterial injury is a big concern after lower limb fracture. Those injuries are common, and potentially devastating problem that carries the greater risk of limb loss, functional disability and mortality. The independent predictors of amputation include complex soft tissue injury, nerve injury, and extremity abbreviated injury score (MULLENIX et al., 2006). The overall mortality varies from 2.8% to 9% (KAUVAR et al., 2011; ASENSIO et al., 2006), with predictors including age >45 years, Injury Severity Score >25, associated venous and abdominal injury, hypotension, hypothermia, and acidosis; coagulopathy in the operating room and the need for polytetrafluoroethylene (PTFE) repair (ASENSIO et al., 2006). Time taken for treatment, generally estimated at less than 6 hours, constitutes a factor of good functional prognosis for the member. This is explained by the fact that muscle pain occurs after 6 hours of anoxia.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 17 July 2020 and was last updated on 17 July 2020 (registration number INPLASY202070078).

INTRODUCTION

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is the amputation rate and mortality after revascularization of an AI to FF and / or TF?

Rationale: Traumatic arterial injuries are a serious concern. The management of traumatic arterial injuries associated with fractures of the lower limb of the patient constitutes a real challenge. The main issue is the functional and vital prognosis with an overall mortality rate of 2.8% to 9%. Despite this high mortality rate, evidences on the distribution of this kind of lesion among trauma patients are lacking.

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METHODS

Participant or population: Cohort studies, cross-sectional studies, case-control studies with available data on the incidence and mortality of the prevalence of traumatism arterial injury associated with fracture of lower limb.

Intervention: Not applicable.

Comparator: Not applicable.

Study designs to be included: cohort studies, cross-sectional studies, case-control studies

Eligibility criteria: Cohort studies, cross-sectional studies, case-control studies with available data on the incidence and mortality of the prevalence of traumatism arterial injury associated with fracture of lower limb.

Information sources: We searched for the studies in the following database MEDLINE, EMBASE, WHO Global Health Library databases . The databases will be searched using the following terms "Lower extremity" OR "Lower limb" OR "bone fractures" OR "Femoral fractures" OR "tibial fractures"and "Vascular injuries" OR "vascular injury" OR "femoral artery" "femoral arteries" OR "popliteal artery" OR"popliteal arteries" OR "tibial artery" OR "tibial arteries". Finally we will search for relevant articles in the journals of the following learned societies: European Society for Vascular Surgery, American association for vascular surgery and International Society of Orthopedic Surgery and Traumatology. An additional search using the same terms was carried out on Google Scholar. The search was limited to human studies and had no language restrictions. Reference lists of all primary studies were reviewed to identify additional relevant citations.

Main outcome(s): The proposed systematic review and meta-analysis will show us the prevalence of traumatic arterial injury associated with femoral fracture and / or tibial fracture in trauma to the lower limb, the most common pathological form of arterial injury associated with femoral fracture and / or tibial fracture, the amputation rate and mortality after revascularization of an arterial injury to femoral fracture and / or tibial fracture.

Data management: Using a standardized and pre-tested data extraction form, we will collect information on the author, country, year of publication, sample size, average or median age of the population, sex ratio, prevalence of lesions studied,

amputation rate and mortality after revascularization. Two researchers (FAB, FNM) will extract the data independently of the included studies. Any disagreement will be solved by discussion . A third investigator will be consulted and will decide on unresolved disagreements. An organization chart will be presented to outline all of the data selection and extraction processes.

Quality assessment / Risk of bias analysis: The quality of eligible studies will be assessed by two authors (FAB and FNM) using the Newcastle Ottawa scale. An additional file shows this score in detail. The assessment of the possible risk of bias will be classified into 3 groups: high risk, moderate risk and low risk. In case of insufficient data reported by the study, we will classify the risk of bias as uncertain. The authors of those articles will be contacted for further information. The risk of selection bias will be assessed using the Cochrane Guidelines available in Review Manager V.5.3 (http://tech.cochrane.org/revman).

Strategy of data synthesis: The data collected will be analyzed using Stata V.13 software (Stata Corp). A meta-analysis will be performed for data obtained from similar studies. We will first determine the "SEs" for the study-specific estimates from the point estimate (mean, proportion, OR or RR and confidence intervals) assuming a binomial distribution. We will stabilize the variance of individual studies with "The Freeman- Tukey double arc-sine transformation" to maintain the effect of studies with extremely small or large estimates. We will then pool the specific estimates using a random effect meta-analysis model to obtain a summary overall estimate of the prevalence between studies. The publication bias assessment will be performed using the funnel plots and the Egger's test. A value of p<0.1 on Egger's test will be considered indicative of statistically significant publications bias. Heterogeneity will be assessed using the Chi-square test on the Cochrane Q statistic which is quantified by the I2 values of 25%, 50% and 75% respectively represent low,

medium and high heterogeneity. In the event of significant heterogeneity, we will perform a subgroup analysis using the following grouping variables: WHO region, sex, age group, quality of the study, study setting (study in a civilian or military environment), mechanism (open or closed trauma), presence or absence of cranioencephalic, thoracic and / or abdominal trauma, and the delay in taking charge. In the absence of substantial heterogeneity between studies, a meta-analysis will be performed for the overall prevalence and the rate of amputation following revascularization in studies with similar characteristics.

Subgroup analysis: None.

Sensibility analysis: If necessary, sensitivity analysis will be carried.

Language: No restriction.

Country(ies) involved: Senegal; Cameroon; USA; France.

Keywords: Systematic review; arterial injury; fracture; lower limbs.

Contributions of each author:
Author 1 - Arroye Bétou Fabrice Stéphane - conceived and designed the protocol, draft the manuscript, and revised successive drafts of manuscript. he is the guarantor of the review.
Author 2 - Nyankoue Mebouinz Ferdinand - conceived and designed the protocol, draft the manuscript, and revised successive drafts of manuscript.
Author 3 - Mazou N Temgoua - conceived and designed the protocol , and revised successive drafts of manuscript.
Author 4 - Mbanya Armand - revised successive drafts of manuscript.
Author 5 - Bigna Rim Jean Joel - revised successive drafts of manuscript.